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<p>93-352548/45 A14 B05 D21 (A96) BADI 92.04.29          BASF AG *DE 4213971-A1          92.04.29 92DE-4213971 (93.11.04) C08F 220/04, A61K 9/10, C08F 220/34, 222/02, 226/06, 222/04, 220/60, B01F 17/52          New copolymer from unsatd. carboxylic acid and quat. ammonium cpd. - useful as thickener and dispersant for aq. systems, esp. cosmetics          C93-156473</p>	<p>A(4-D1, 4-F4, 4-F5, 12-V1, 12-V4, 12-W12C) B(4-C3B, 12-M9) D(8-B)</p>
<p>Copolymer (A), produced by radical initiation, comprises (a) 50-99.99 wt.% olefinic 3-5C mono- and/or 4-8C di-carboxylic acid or anhydride; (b) 0.01-50 wt.% olefinic quat. ammonium cpd. of formulae (I) or (II); (c) 0-49.99 wt.% (meth)acrylate of formula (III); (d) 0-49.99 wt.% additional copolymerisable monomers and (e) 0-5 wt.% one or more crosslinkers with at least 2 olefinic gps.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div> <math display="block">\text{CH}_2=\text{CH}-\text{N}^+\begin{matrix} \text{R}_2 \\ \text{R}_1 \end{matrix} \text{X}^- \quad \text{(I)}</math> </div> <div> <math display="block">\text{CH}_2=\text{CH}-\text{C}(=\text{O})-\text{Y}-\text{A}-\text{N}^+\begin{matrix} \text{R}_3 \\ \text{R}_4 \\ \text{R}_1 \end{matrix} \text{X}^- \quad \text{(II)}</math> </div> </div>	<div style="text-align: center;"> <math display="block">\begin{matrix} \text{R}_2\text{O} &amp; \text{R}_5 \\   &amp;   \\ \text{H}_2\text{C}=\text{C}-\text{C}-\text{Y} &amp; \text{CH}_2-\text{CH}_2-\text{O} \end{matrix} \quad \text{(III)}</math> </div> <p>R<sub>1</sub> = 6-20C alkyl or alkenyl, 5-8C cycloalkyl, phenyl (opt. substd. by 1-12C alkyl or phenyl(1-12C)alkyl);          R<sub>2</sub> = H, Me or phenyl;          R<sub>3</sub>, R<sub>4</sub> = H or 1-4C alkyl;          X = halo or 1-4C alkylsulphate or alkylsulphonate;          one of R<sub>3</sub> and R<sub>4</sub> may also be 1-4C alkylsulphate or 1-4C alkylsulphonate to form a betaine structure;          Y = O or NH;          A = 1-6C alkylene;          R<sub>5</sub> = H, Me or Rt;          n = 0-25.</p> <p><b>USE/ADVANTAGE</b>          (A) are useful as thickeners and dispersants for aq. systems, esp. cosmetics, but also technical and pharmaceutical products. They can produce gels and impart long-</p> <p style="text-align: right;">DE4213971-A+</p>

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term stability to emulsions at low use concns.

(A) can be prep'd. in aq. systems, have improved electrolyte stability (because of their partly ampholytic character) and the cationic component ensures good affinity for skin and hair.

#### PREFERRED MATERIALS

(a) is (meth)acrylic acid or maleic anhydride, and (e) is pentaerythritol triallyl ether (e1); oleyl methacrylate; diallyl tartaric acid amide; bis-acrylamidoacetic acid, methylene-bis acrylamide or polyethyleneglycol di(meth)acrylate.

In (I) and (II), R<sub>1</sub> = 12-18C alkyl or alkenyl, or benzyl; X = Cl, Br, methyl or ethyl sulphate or sulphonate, or one of R<sub>3</sub> and R<sub>4</sub> = 1-3C alkylsulphonate; A = 2-4C alkylene.

#### PREFERRED COMPOSITION

(A) contains (by wt.) 70-99.85% (a); 0.1-29.95% (b); 0-29.85% (c); 0-29.85% (d) and 0.05-2% (e).

#### PREPARATION

(A) can be produced in a solvent, e.g. trichloroethane, which dissolves the monomers but not (A), so that (A) is formed as a finely divided powder.

Alternatively, polymerisation is carried out by reverse emulsion or suspension methods, i.e. in the hydrophilic phase of a water in oil emulsion.

#### EXAMPLE

A vessel was charged with i.e. trichloroethane, 200g acrylic acid, 8g N-dodecyl-N'-vinylimidazolium bromide and 1.2g e1, flushed with N<sub>2</sub> and heated to 80°C. Then 80 ml same solvent contg. 0.3g dilauroyl peroxide were added and after 4 hr. reaction the mixt. was cooled. The polymer was filtered off, washed and dried.

0.4g of the polymer were dispersed in 30 ml paraffin oil, then 100ml water mixed in, followed by 4ml 10% triethanolamine soln. The mixt. was homogenised to give an emulsion of viscosity 6.2 Pa.s. (10pp12510BDwgNo0/0)

Addnl. Data: SCHADE C, SANNER A, WEKEL H, FROSCH F, WESTENFELDER H

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